KIPOR®

KIPOR POWER

OPERATION MANUAL

PLEASE READ THIS MANUAL CAREFULLY.
IT CONTAINS IMPORTANT SAFETY INFORMATION.

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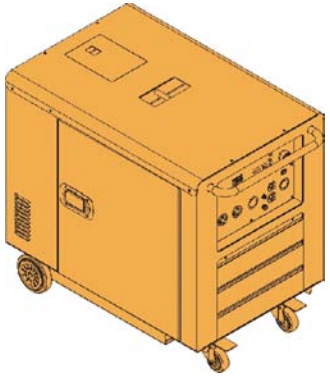

DIGITAL DIESEL GENERATOR SET

ID6000

Version 1, Printing date 16/05/2008

PREFACE

Thank you for purchasing our generators.
This manual covers operation and maintenance of ID6000 generator.
All information in this publication is based on the latest product information available at the time of approval for printing.
We reserve the right to make changes at any time without notice and without incurring any obligation.
No part of this publication may be reproduced without written permission.
This manual should be considered a permanent part of the generator and should be reserved with it if it is resold.

Pay special attention to statements preceded by the following words:

DANGER Failure to properly follow these precautions can result in serious injury or DEATH!

WARNING Failure to properly follow these precautions can result in property damage, serious injury or DEATH!

CAUTION The generators are designed to give safe and dependable service if operated according to instructions. Failure to do so could result in personal injury or equipment damage.

If a problem should arise, or if you have any questions about the generator, consult an authorized dealer.

WARNING Indicates a possibility of personal injury or equipment damage if instructions are not followed.
Read and understand the Owner's Manual before operating the generator.
Operate only in well ventilated areas. Exhaust gas contains poisonous carbon monoxide, and can be deadly.
Always stop engine before refueling. Wait 5 minutes before restarting.
Check for spilled fuel or leaks. Clean and/or repair before use.
Keep any sources of ignition away from fuel tank at all times.

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2. The choice of the electric cable

The choice of the electric cable depends on the allowable current of the cable and the distance between the load and the generator. And the cable section should be big enough.
If the current in the cable is bigger than the allowable current, it will become over hot and the cable will be burnt. If the cable is long and thin, the input voltage of the electric appliance will be not enough, causing that the generator doesn't start. In the following formula, you can calculate the value of the potential "e".

$$\text{Potential (v)} = \frac{1}{58} \times \frac{\text{Length}}{\text{Section area}} \times \text{Current (A)} \times \sqrt{3}$$

The relations among of the allowable current, and length, section of the Insulating cable (single core, multi-core) are as follow:
(Presume that the use voltage is 220V and the potential is below 10V.

Ambient temperature：25℃

No.	Copper cables model	Single core Current capacity (25 ℃)(A)		Voltage Drop mv/M	Three cores Current capacity (25 ℃)(A)		Voltage Drop mv/M	Four cores Current capacity (25 ℃)(A)		Voltage Drop mv/M
		VV22	YJV22		VV22	YJV22		VV22	YJV22	VV22
1	1.5mm^2	20	25	30.86	13	18	30.86	13	13	20
2	2.5mm^2	28	35	18.9	18	22	18.9	18	30	28
3	4mm^2	38	50	11.76	24	32	11.76	25	32	38
4	6mm^2	48	60	7.86	32	41	7.86	33	42	48
5	10mm^2	65	85	4.67	45	55	4.67	47	56	65
6	16mm^2	88	110	2.95	61	75	2.6	65	80	88
7	25mm^2	113	157	1.87	85	105	1.6	86	108	113
8	35mm^2	142	192	1.35	105	130	1.2	108	130	142
9	50mm^2	171	232	1.01	124	155	0.87	137	165	171
10	70mm^2	218	294	0.71	160	205	0.61	176	220	218
11	95mm^2	265	355	0.52	201	248	0.45	217	265	265
12	120mm^2	305	410	0.43	235	292	0.36	253	310	305
13	150mm^2	355	478	0.36	275	343	0.3	290	360	355
14	185mm^2	410	550	0.3	323	400	0.25	333	415	410
15	240mm^2	490	660	0.25	381	480	0.21	400	495	490

Note: The variation of temperature and the laying of cables will influence the current capacity of cables, the table above is just used for reference.

1. SAFETY INSTRUCTION

WARNING

■ The generators are designed to give safe and dependable service if operated according to instructions.
Read and understand the Owner's Manual before operating the generator. Failure to do so could result in personal injury or equipment damage.
■ Please use light diese. Gasoline and pafaffin is not allowed to use

WARNING

■ Exhaust gas contains poisonous carbon monoxide. Never run the generator in an enclosed area. Be sure to provide adequate ventilation.
■ Generator should be earthed with a wire to avoid electric shock

WARNING

■ The muffler becomes very hot during operation and remains hot for a while after stopping the engine.
Be careful not to touch the muffler while it is hot.
Let the engine cool before storing the generator indoors.
■ The engine exhaust system will be heated during operation and remain hot immediately after stopping the engine.To prevent scalding, pay attention to the warning marks attached to the generator.
■ Battery charge should be carried out in the place with good ventilation. Smoke and spark is forbidden.

Ensure safe operation

WARNING

■ Gasoline is extremely flammable and explosive under certain conditions. Refuel in a well ventilated area with the engine stopped.

■ Keep away from cigarette, smoke and sparks when refueling the generator, Always refuel in a well-ventilated location.

■ Wipe up spilled gasoline at once.

WARNING

■ Connections for standby power to a building's electrical system must be made by a qualified electrician and must comply with all applicable laws and electrical codes. Improper connections can allow electrical current from the generator to back feed into the utility lines. Such back feed may electrocute utility company workers or others who contact the lines during a power outage, and when utility power is restored, the generator may explode, burn, or cause fires in the building's electrical system.

WARNING

■ Always make a pre-operation inspection before you start the engine to prevent an accident or equipment damage.

■ Place the generator at least 1m away from buildings or other equipment during operation.

■ Operate the generator on a level surface. if the generator is tiled, fuel spillage may result.

■ Know how to stop the generator quickly and understand operation of all the controls. Never permit anyone to operate the generator without proper instructions.

■ Keep children and pets away from the generator when it is in operation.

■ The generator is a potential source of electrical shocks when misused; do not operate with wet hands.

■ Do not operate the generator in rain or snow and do not let it get wet to avoid electric shock.

13. APPENDIX

1. Modified coefficient table of ambient condition power

The conditions of generator rated output:

Altitude: 0 m Ambient temperature: 25℃ Relative humidity: 30%

Ambient modified coefficient: C (Relative humidity 30%)

Altitude (m)	Ambient temperature (℃)				
	25	30	35	40	45
0	1	0.98	0.96	0.93	0.90
500	0.93	0.91	0.89	0.87	0.84
1000	0.87	0.85	0.82	0.80	0.78
2000	0.75	0.73	0.71	0.69	0.66
3000	0.64	0.62	0.6	0.58	0.56
4000	0.54	0.52	0.5	0.48	0.46

Note: When the relative humidity is 60%, the modified coefficient is C-0.01

When the relative humidity is 80%, the modified coefficient is C-0.02

When the relative humidity is 90%, the modified coefficient is C-0.03

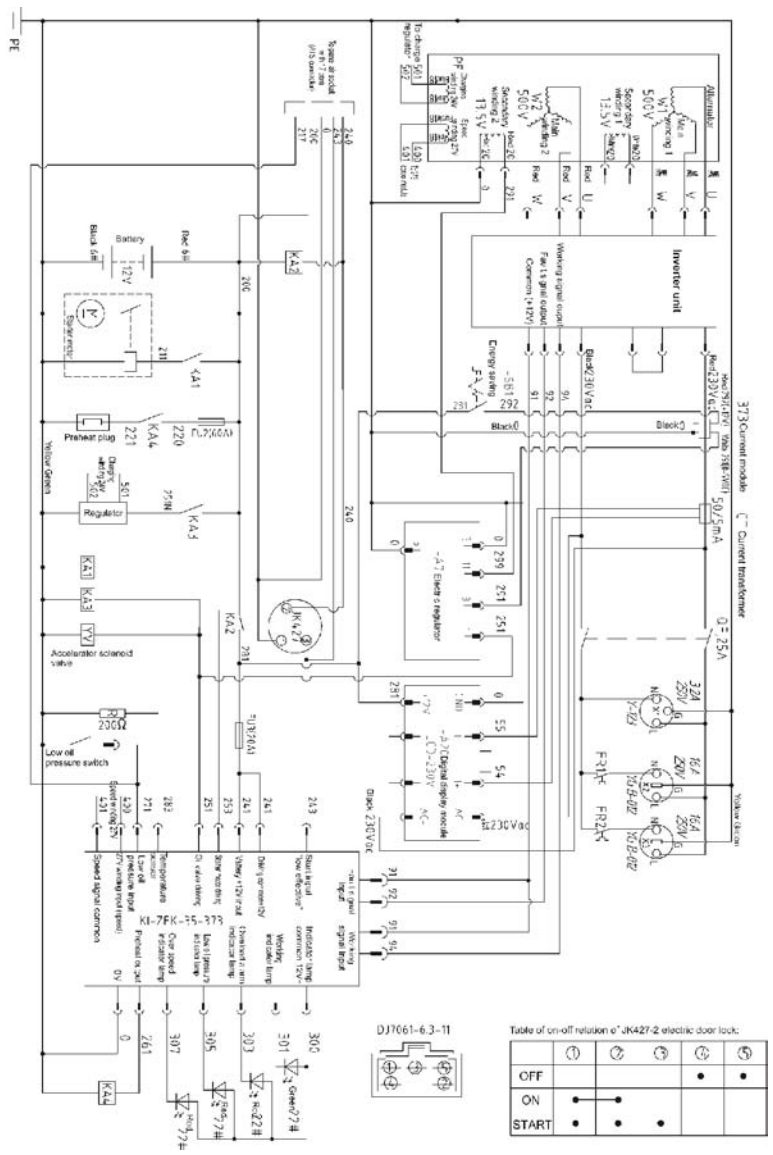
When the relative humidity is 100%, the modified coefficient is C-0.04

Counting example:

When the rated power of generator is P_N =5KW, altitude is 1000m, ambient temperature is 35℃, relative humidity is 80%, the rated power of generator is:

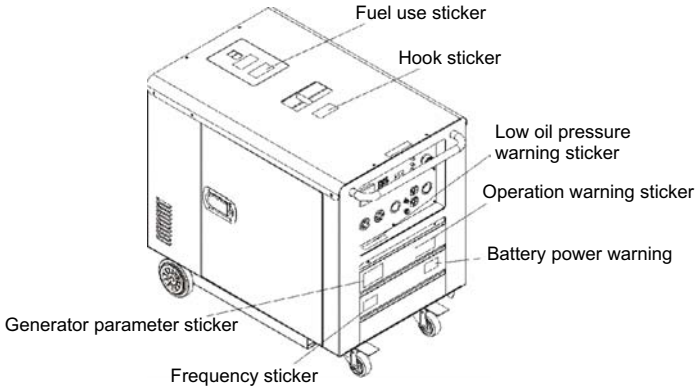
$P=P_N \times (C-0.02) = 5 \times (0.82-0.02) = 4KW$

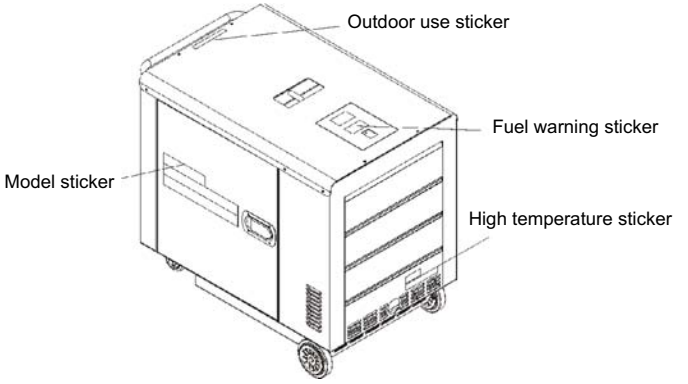
12.2 Single voltage



2. SAFETY LABEL LOCATION

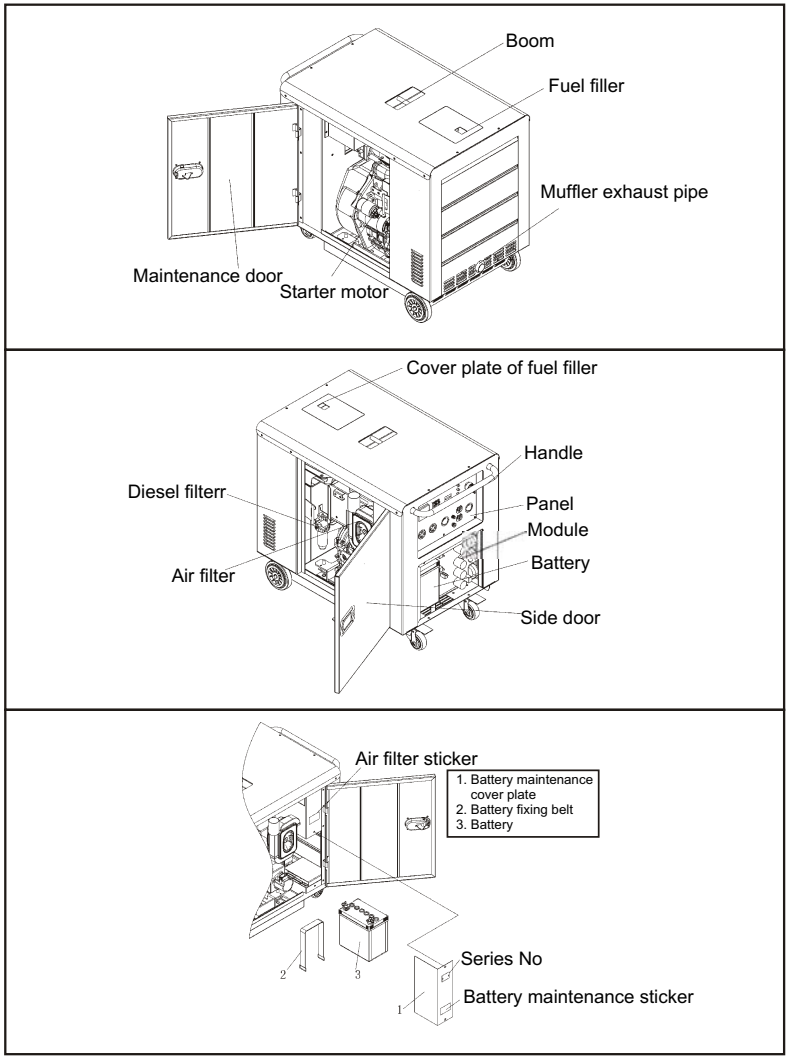
These lables warn you potential hazards that can cause serious injury. Read the labels and safety notes and precautions described in manual carefully.





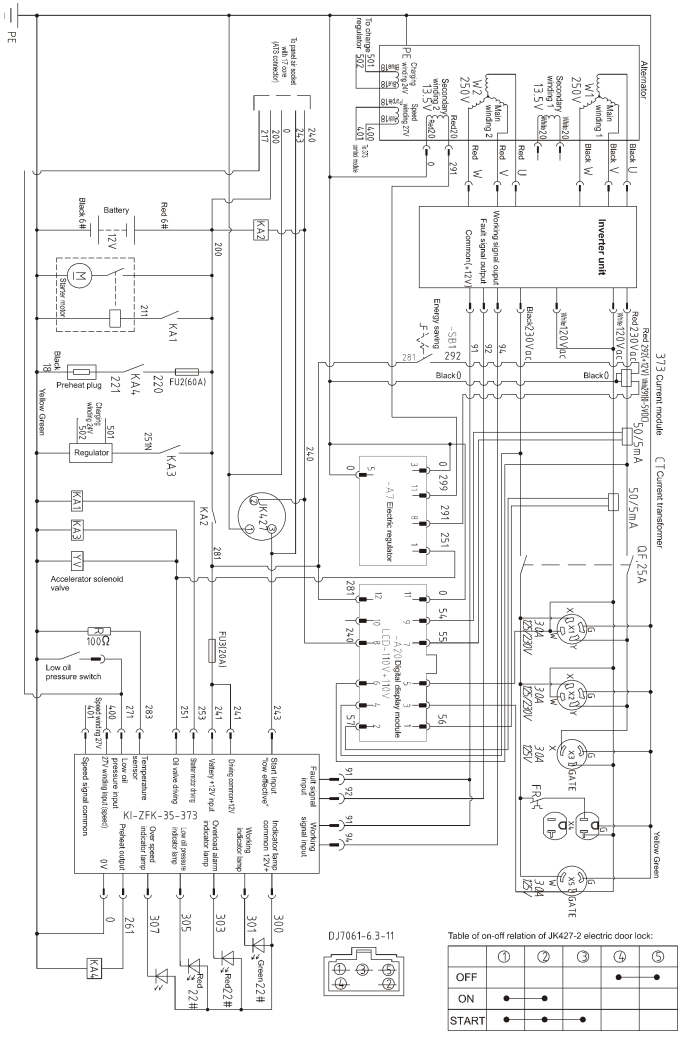
3. COMPONENT IDENTIFICATION

1. Profile drawing



12. ELECTRIC DIAGRAM

12.1 Dual voltage



11. SPECIFICATION

Model		ID6000	
Rated frequency (Hz)		50	60
Rated output (kVA)		5	
Max. output (kVA)		5.5	
Rated voltage (V)		115/230	120/240
Rated current (A)		43.5/21.7	41.7/20.8
Rated rotation speed (r/min)		1700-3300	
Alternator	Model	KD70	
	Motor type/Converter type	Multi-pole permanent magnet motor /IGBT digital converter	
	Loop type	Single phase three loops	
	Power factor(COSΦ)	1	
	Insulation grade	F	
Engine	Model	KD186FGETi	
	Cylinder type	Vertical single cylinder, four stroke, air cooled, direct injection	
	BoreXStroke	86 × 75	
	Displacement	436	
	Compression ratio	19.6 ∶ 1	
	Rated power	6.3/3600	
	Lub. mode	Pressure splash	
	Lubricant	Above CD grade or SAE10W – 30， 15W – 40	
	Lubricant capacity	1.65	
	Starting system	Electric starter	
	Battery capacity	12V – 36Ah	
	Fuel type	Diesel: 0 # (summer), – 10 # (winter), – 35 # (chilliness)	
Fuel consumption		⩽340	
Fuel tank capacity		14.5	
Continuous running time (hr) (at rated output)		6.5	
Noise (zero load- full load)		62-69	
Dimension (LxXWXH)		875 × 530 × 750	
Net weight		168	
Structure		Silent	

2. Electric system

2.1 Elements and function

Digital diesel generator consists of alternator, AC inverter, electric regulator, electric control system, harness and output/input units.

The functions of each units are listed as follow:

2.2 Alternator:

Alternator adopts permanent magnet generator, consisting of stator, rotor and shell. The rotor without bearings adopts one piece design with engine Fixed at one side of crankshaft , brushless and natural draft. The stator adopts multi-pole and multi-voltage windings. It is rotates with the crankshaft to outuput three phase AC. The generator features small volume, simple structure and high efficiency.

2.3 AC inverter:

AC voltage output by alternator is rectified and inverted for AC loads. AC inverter module includes protection for overload, over voltage, over frequency, over heat etc.

2.4 Electric regulator:

Electric regulator features convenient installation, rapid response, good regulation and safety.

It can automatically regulate the engine speed depending on the loads to ensure the best economics

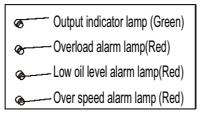
Note:

Engine speed range should be according with the AC inverter total output power:

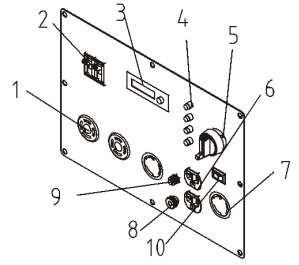
Rated low speed——zero load

Rated high speed——Rated max. output power

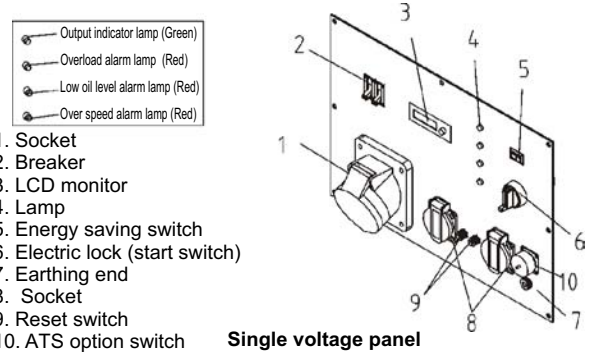
3. Control panel



1. Socket
2. Breaker
3. LCD monitor
4. Lamp
5. Electric lock (start switch)
6. Conjoined socket
7. Socket
8. Earthing end
9. Reset switch
10. Energy saving switch



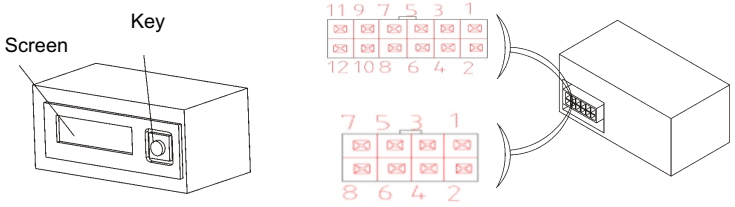
Dual voltage panel



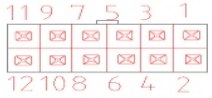
1. Socket
2. Breaker
3. LCD monitor
4. Lamp
5. Energy saving switch
6. Electric lock (start switch)
7. Earthing end
8. Socket
9. Reset switch
10. ATS option switch

Single voltage panel

3.1. LCD instruction:

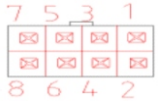


3.1.1 Instructions of dual voltage connector



Item	Function	Item	Function	Item	Function
1	A phase AC voltage input	5	5、6 out external switch, Series connection when closed Parallel connection when open	9	B phase current transformer input
2	B phase AC voltage input	6		10	B phase current transformer input
3	A phase AC voltage input	7	A phase current transformer input	11	External battery GND
4	B phase AC voltage input	8	A phase current transformer input	12	External battery 12V

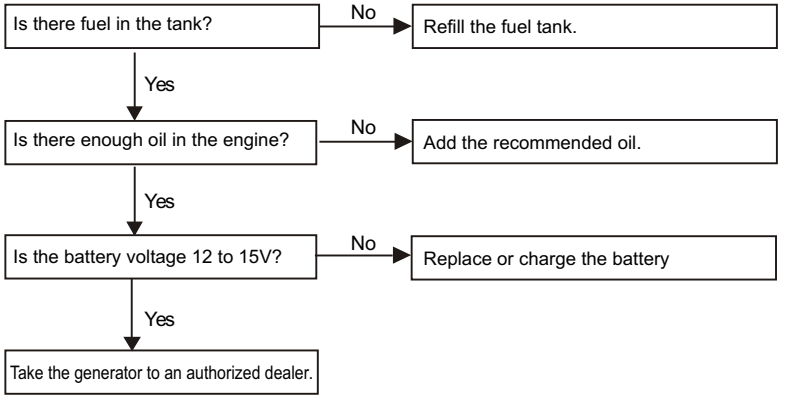
3.1.2 Instructions of single voltage connector



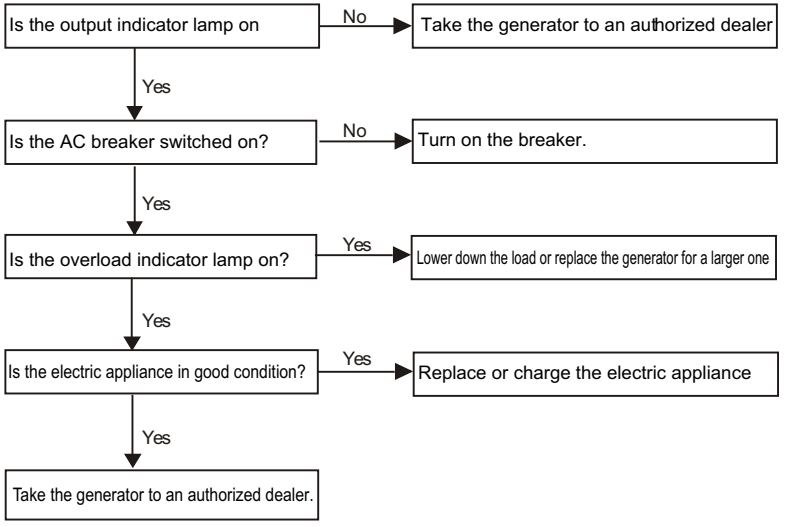
Item	Function	Item	Function	Item	Function
1	AC voltage input	4	Relay control signal output (+12v)	7	External battery GND
2	AC voltage input	5	Current transformer input	8	External battery 12V
3	Current transformer input	6	Relay control signal output (GND)	9	

10. TROUBLE SHOOTING

When the engine will not start:



The engine fails to run with load:


Is the output indicator lamp on
No
Take the generator to an authorized dealer
Yes
Is the AC breaker switched on?
No
Turn on the breaker.
Yes
Is the overload indicator lamp on?
Yes
Lower down the load or replace the generator for a larger one
Yes
Is the electric appliance in good condition?
Yes
Replace or charge the electric appliance
Yes
Take the generator to an authorized dealer.

9. TRANSPORTING/STORAGE

l spillage when transporting or during temporary storage, the genera-tor should be secured upright in its normal operating position, When transporting the generator:

WARNING

■ Do not overfill the tank (there should be no fuel in the filler neck)

■ Do not operate the generator while it is on a vehicle. Take the generator off the vehicle and use it in a well ventilated place.

■ Avoid a place exposed to direct sunlight when putting the generator on a vehicle. If the generator is left in an enclosed vehicle for many hours, high temperature in-side the vehicle could cause fuel to vaporize resulting in a possible explosion.

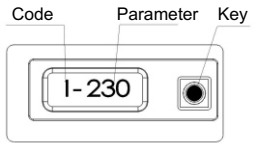
?Do not drive on a rough road for an extended period with the generator on board, if you must transport the generator on a rough road, drain the fuel from the generator beforehand.

Before long while storag, the following items should be done:
(1) Run the generator for 5 minutes without any load.
(2) Drainage the oil and refill the new oil.
(3) Drainage the fuel to a clean container and clean the fuel tank.
(4) Clean the dirty in generator. Seal the generator with a plastic cover for safekeeping in dry place.

WARNING

Fuel is explosive and flammable. Smoke, fire and spark are forbidden.

1. For example LCD-230V
1---Genset output voltage (V); 2---Genset current with load (A);
3---Genset frequency (Hz); 4---Genset running time;
5---Battery voltage.
Shift the parameters by the button



2. LCD-120V / 240V
(1) Output in parallel:
1---output voltage; 4---output current; 6---output frequency;
7---Running time; 8---Battery voltage; (2、3、5 are shielded)
(2) Output in series:
1---Sum of A, B phase voltage; 2---A phase voltage; 3---B phase voltage;
4---A phase current; 5---B phase current; 6---output frequency;
7---Running time; 8---Battery voltage;

3.1.3 Maintenance information

1. Maintenance will be reminded after specific running time. LCD lamp twinkles and the codes will be displayed. If there is many codes, they may be displayed in turns at an interval of 3 seconds if there is many codes.

Item	Maintenance information	Code
1	Oil	SV 1
2	Oil filter	SV 2
3	Air filter	SV 3
4	Nozzle pump	SV 4
5	Valve clearance	SV 5
6	Tank and filter	SV 6

2. Press the button to read the parameters. Release the key for 2 seconds to have the maintenance
Remind.
3. Press the button for 5 seconds to clear the maintenance information.

3.2 Instruction of energy saving switch:

Energy saving switch：
When Energy saving switch locates the side of "OFF"， the speed of engine varies when output power varies. Power increases while speed increases. Engine will run under the low speed without any load; the total machine will work in perfect economic state.
When Energy saving switch locates the side of "ON"， Engine will run under the max. speed. Inverter module reaches max. power. This mode must be used during sudden load and unload.

4. PRE-OPERATION CHECK

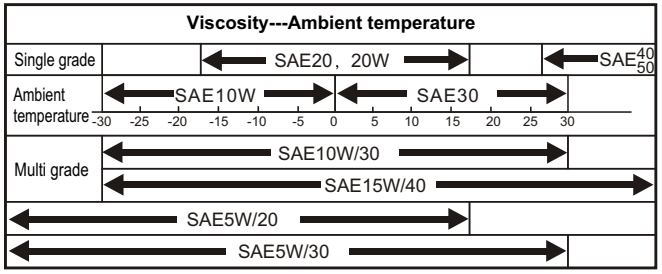
WARNING ■ Be sure to check the generator on a level surface with the engine stopped

1. Check the engine oil level

WARNING ■ Using nondetergent oil or 2-stroke engine oil could shorten the engine's service life.

Use a high-detergent, premium quality 4-stroke engine oil. certified to meet CC or CD grade SAE10W-30 oil is recommended.

Select the appropriate viscosity of oil according to the ambient temperature.



SAE Viscosity grade table

Open the left door, Loose the cap and wipe the dipstick with a clean rag. Check the oil level by inserting the dipstick in the filler hole after fastened.

If the oil level is below the end of the dipstick, refill the recommended oil up to the top of the oil filler neck.

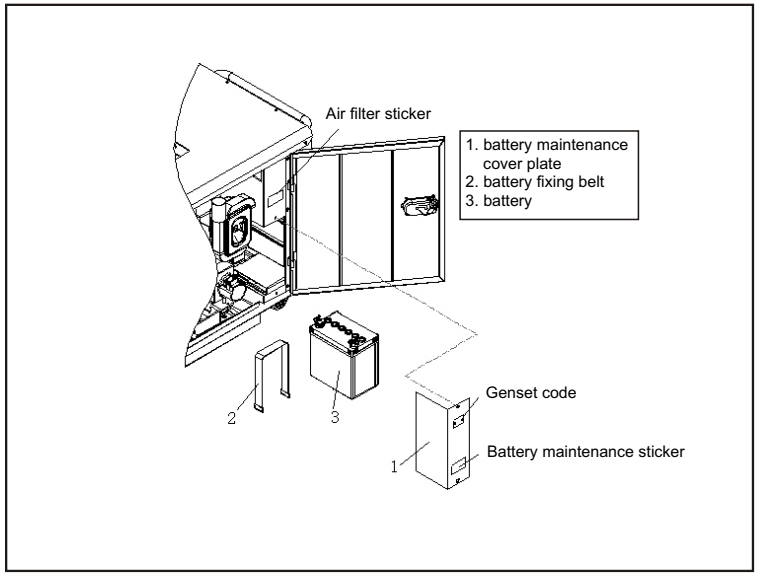
WARNING ■ Running the engine with insufficient oil can cause serious engine damage.

CAUTION ■ The Low Oil Alarm System will automatically stop the engine before the oil level falls below the safe limit. However, to avoid the inconvenience of an unexpected shutdown, it is still advisable to visually inspect the oil level regularly

a. Open the left door, loose the hoop and remove the diesel filter
b. Replace the diesel filter
c. Reinstall the filter element. Fix the hoop and close the left door.

4. Pump maintenance:

Do not dismantle the pump randomly. Please contact KIPOR dealer if special tools are required for pump replace and clean.



5. Battery maintenance

a. Unscrew the bolts on cover plate, remove the cover plate；
b. Remove the fixing belt；
c. Replace the battery and fasten the fixing belt, install the cover plate, fasten the bolts and close the side door.

CAUTION

■ For enviroment protection, we recommend that the waste oil should be kept in seal containers and send to the repair agency and recycling center. Do not drain the oil to the ground or rubbish.

2. AIR CLEANER SERVICE

A dirty air cleaner will restrict air flow to the engine cylinder. To prevent it, service the air cleaner regularly. Service more frequently when operating the generator in extremely dusty areas.

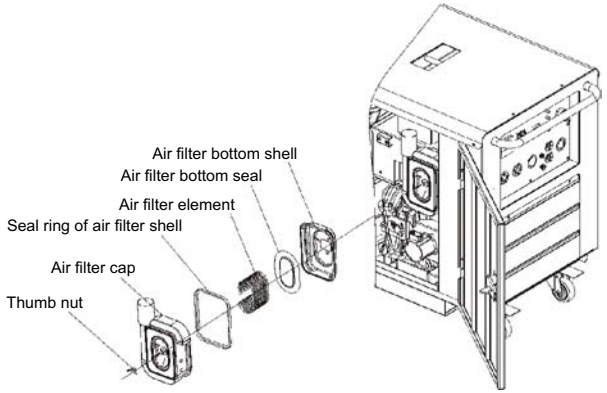
CAUTION

■ Do not use gasoline or low flash point solvents for cleaning. They are flammable and explosive under certain conditions.

■ Please replace the filter element if power is reduced or exhaust smoke color is abnormal.

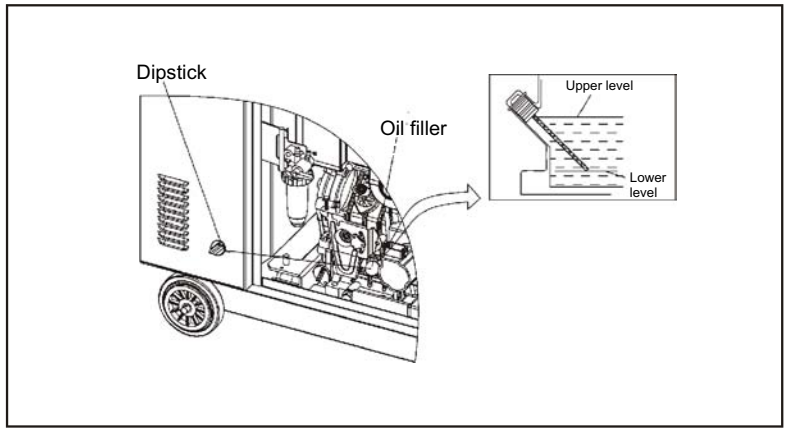
■ Do not run generator without air cleaner for causing engine accelerated wear.

a. Open the side door.
b. Loose the nut on filter cap, disconnect the cap.
c. Take out the air filter
d. Clean the dirty on filter element, but detergent is not allowed.
e. Re-install the filter element, lock the cap and close the side door.



3. Fuel filter maintenance

A dirty fuel filter will restrict fuel flow to pump. To prevent it, service the fuel filter regularly.



2. Check the fuel level

Use automotive light diesel.
If the fuel level is low, refuel the fuel tank until the level increased to the specified mark.
Never use an oil/diesel mixture or dirty diesel.
Avoid getting dirt, dust or water in the fuel tank.
After refueling, tighten the oil rule seurely.

WARNING

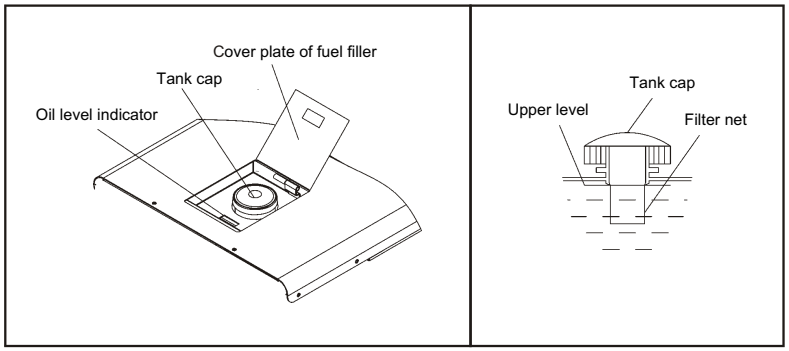
■ Diesel is extremely flammable and is explosive under certain conditions.

■ Refuel in a well-ventilated area with the engine stopped. Do not smoke or allow flames or sparks in the area where the engine is refueled or where fuel is stored.

■ Do not overfill the fuel tank (there should be no fuel above the upper limit mark). After refueling, make sure the tank cap is closed properly and securely.

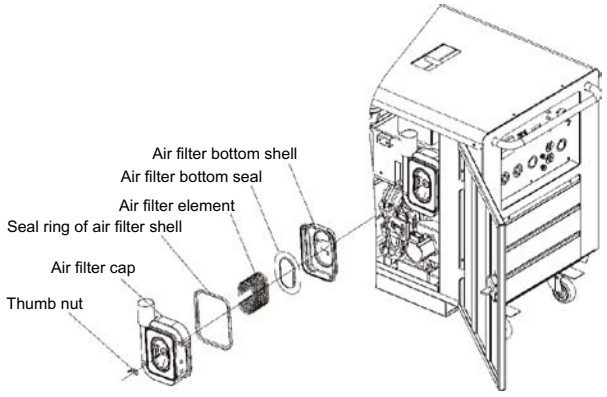
■ Be careful not to spill fuel when refueling. Spilled fuel or fuel vapor may ignite, If any fuel is spilled, make sure the area is dry before starting the engine.

■ Avoid repeated or prolonged contact with skin or breathing of vapor. KEEP OUT OF REACH OF CHILDREN



3. Check the air cleaner

Check the air cleaner element to be sure it is clean and in good condition.
Open the right door, loose the nut and remove the cap to check the filter element.
Clean or replace the element if necessary.



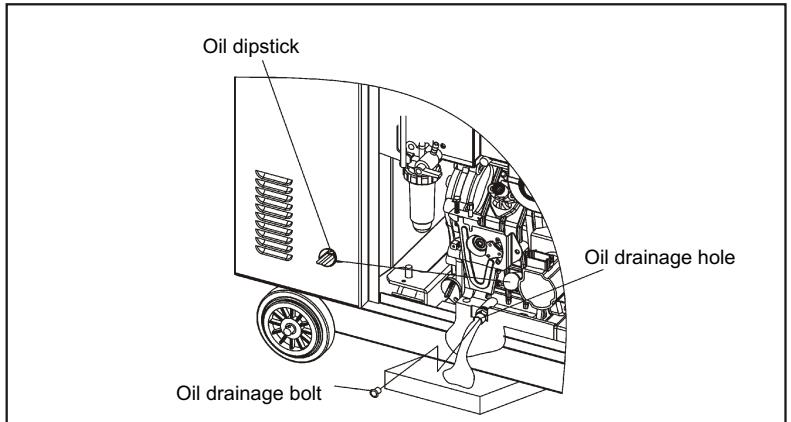
⚠ CAUTION Never run the engine without the air cleaner. Rapid engine wear will result from contaminants.

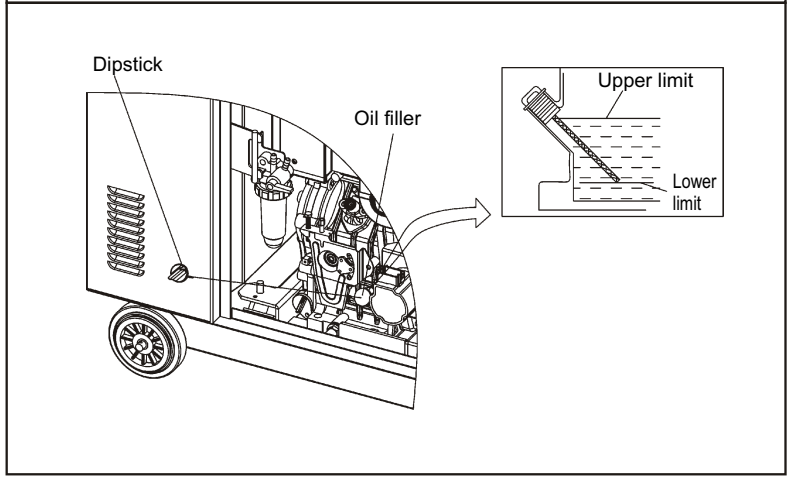
4. Check fuel filter

Check the fuel filter to be sure it is clean and in good condition. Open the left door, check the filter element. Clean or replace the element if necessary.

a. Open side door, unscrew the dipstick.
b. Drain the dirty oil to a container
c. Refill the recommended oil to the oil filler level and check it
d. screw the dipstick and close the side door

Oil capacity: **KD186FGETi** E**ngine**: **1.65 L**.





8. MAINTENANCE

The purpose of the maintenance and adjustment schedule is to keep the generator in the best operating condition.

WARNING ■ Shut off the engine before performing any maintenance. If the engine must be run, make sure the area is well ventilated. The exhaust contains poisonous carbon monoxide gas.

CAUTION ■ Use genuine our parts or their equivalent. The use of replacement parts which are not of equivalent qual-ity may damage the generator.

Maintenance Schedule

Item / Regular service period		Each use	First month or 20 hours	Every 3 months or 50 hours	Every 6 months or 100 hours	Every year or 200 hours
Oil	Check	○				
	Replace		○(first time)		○(after second time)	○(after second time)
Oil filter	Check and replace				○	○(Replace)
Air filter	Check	○				
	Clean			○(2)		
Nozzle pump	Clean adjust				○(3)	
Valve clearance	Check adjust					○(3)
Tank and filter	Clean or replace					○
Oil circuit	Check	Every 2 years(replace if necessary)(3)				

NOTE: (1) "O" means normal maintenance interval
(2) "O(2)" means generator used in dirty area. Please shorten the maintenance interval
(3) "O(3)" means maintenance and repair should taken by KIPOR dealer unless professionals are available. Please refer to the maintenance manual.

1. CHANGING OIL

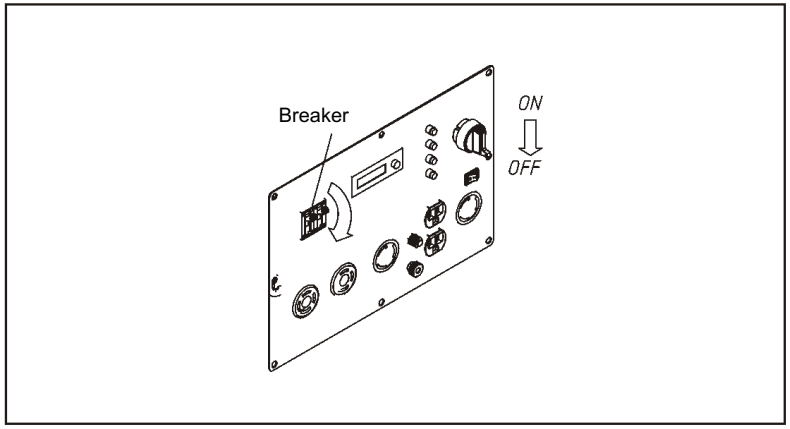
Run generator for 3～5 minutes and stop it. Drain the oil quickly when the generator is heated.

WARNING Ensure the generator is stopped before drainage.

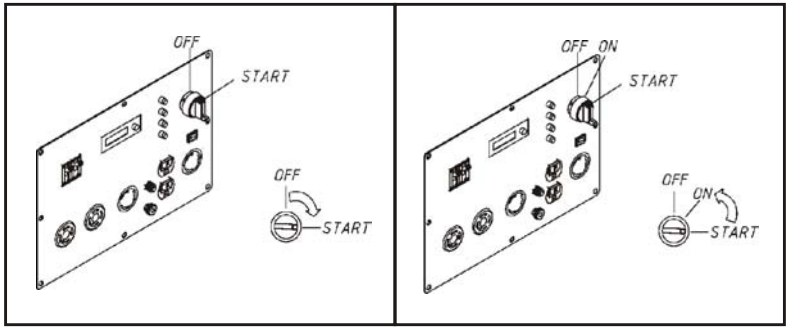
5. STARTING THE GENERATOR

1. Before starting the genset, disconnect the load from the DC terminals.

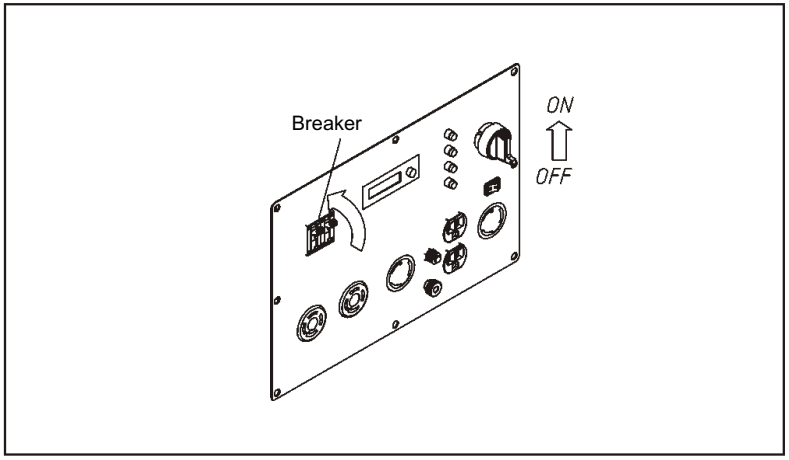
Ensure the breaker is kept at "OFF"



2. Turn the switch to the start position, then generator begins to preheat automatically. Loose it after all lamps lit, the switch returns to "ON", which means generator starts successfully. For start failure, please restart the generator after waiting for 10 minutes.



3. Turn the breaker to "ON", connect with the loads.



4. Instruction:

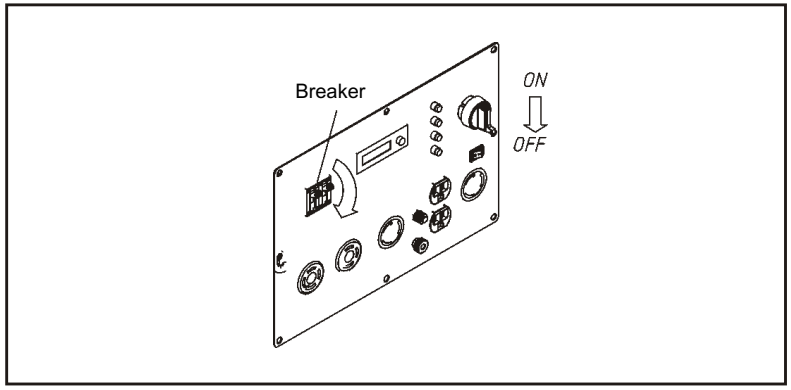
Engine can keep the rated power in standard ambient. If the ambient varies, please refer to GB/T6072.1 for power and fuel consumption.

7. STOPPING THE ENGINE

To stop the engine in an emergency, turn the engine switch to the OFF position.

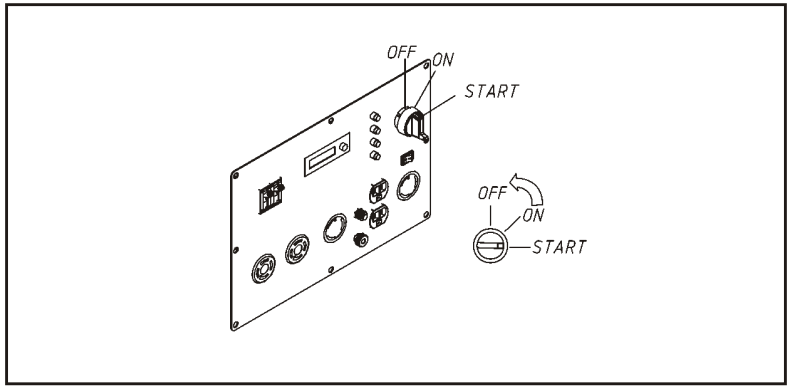
IN NORMAL USE:

1. Turn the breaker to "OFF".



2. Switch off the connected equipment and pull the inserted plug.

3.Turn the engine switch to the OFF position.



⚠ 注 意

Turn the generator start switch to **"**OFF**"**, cut off the battery power for a long while storage

WARNING

■ Battery is easily flammable and vaporized. Keep away from the spark and fire. Charge the battery in the place with good ventilation.

■ Electrolyte contains sulfuric acid which may burn the skin and eyes. Please wear mask and protective clothes.

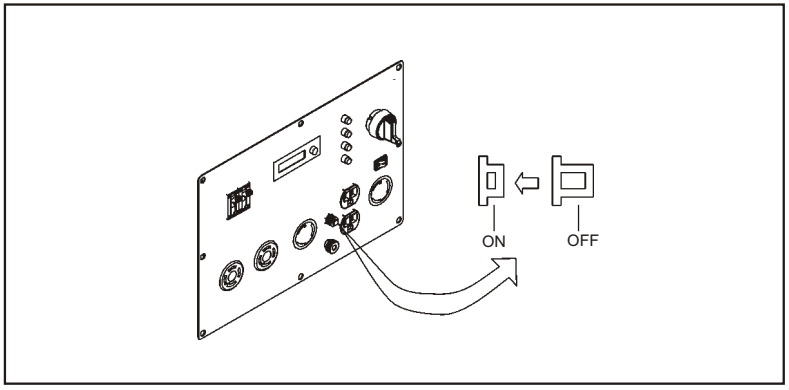
(1) If the electrolyte splashes to skin, wash off by water at once

(2) If the electrolyte splashes to eyes, please wash it by water at least 15 minutes, then go to hospital quickly.

■If electrolyte is swallowed, please drink much water and milk, magnesia or vegetable oil and go to hospital.

■Please charge in the place out of the reach of children.

6.3 Overload DC circuit may result in the protector tripping. In this condition, please disconnect DC load and press the reset key on control panel.

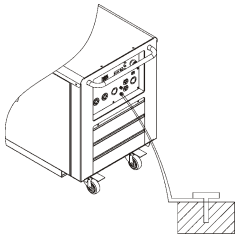


6.4 For electrical equipment, Large current will be generated when the motor drving system starts.

6. GENERATOR USE

WARNING

■ To prevent electrical shock from faulty appliances, the generator should be earthed. Connect a length of heavy wire between the generator's earth terminal and an external ground source.



■ Connections for standby power to a building's electrical system must be made by a qualified electrician and must comply with all applicable laws and electrical codes. Improper connections can allow electrical current from the generator to backfeed into the utility lines. Such backfeed may electrocute utility company workers or others who contact the lines during a power outage, and when utility power is restored, the generator may explode, burn, or cause fires in the building's electrical system.

WARNING

■ Do not overload.

■ Do not exceed the current limit specified for any one receptacle.

■ Do not connect the generator to a household circuit. This could cause the damage to the generator or to electrical appliances in the house.

■ Do not modify or use the generator for other purposes than it is intended for. Also observe the following when using the generator.

A. Do not connect generators in parallel.

B. Do not connect an extension to the exhaust pipe.

■ When an extension cable is required, be sure to use a tough rubber sheathed flexible cable.

■ Limit length of extension cables:： 60 m for cables if 1.5 mm^2； 100m for cables of larger than 2.5 mm^2 and the current capacity within 5A/ mm^2.

CAUTION

■ Keep the generator away from other electric cables or wires such as commercial power supply lines.

■ DC receptacle is availabe for DC power

■ The total power shouldn't exceed the sum of AC and DC power if AC and DC power are used at same time.

■ For most equipment, the motor needs the power higher than rated value for starting

6.1 AC applications

1. Start the engine and make sure the output indicator light (green) comes on.
2. Confirm that the appliance to be used is switched off, and plug in the appliance.

WARNING

■ Overload indicator lamp (red) is on for a long while, generator may be damaged; although overload indicator lamp is on a short while, the generator service lift may still be shortened.

■ Be sure that all appliances are in good working order before connecting them to the generator. If an appliance begins to operate abnormally, becomes sluggish, or stops suddenly, turn off the generator engine switch immediately. Then disconnect the appliance, and examine it for signs of malfunction.

6.2 Output and Overload Indicators

1. In normal condition, ouput indicator lamp (green) is on

☼ Ouput indicator lamp (green)
● Overload alarm lamp(red)
● Low oil level alarm lamp(red)
● Over speed alarm lamp (red)

2. If generator overloads (more than 5.5kVA), or loads have short circuit, ouput indicator lamp (green) will be off while overload lamp(red) will be on. At this time the current to loads will be cut off

☼ Ouput indicator lamp (green)
● Overload alarm lamp(red)
● Low oil level alarm lamp(red)
● Over speed alarm lamp (red)

If red lamp is on, stop the engine and find out the reason.

WARNING

■ Check the load condition before they are connected to the generator

■ Red and green lamp may be on at the same time during geneartor starting. If red lamp is off after 4 seconds, it means the generator is in normal; if the red lamp still keeps on, please contact KIPOR dealer.

3. Low oil level alarm

This system is designed for protecting engine due to lackage of oil. It will stop the engine automatically if the oil level of crankshaft box is below the safe value. (generator switch still keeps in "ON" position). If customers restart the engine, the alarm lamp(red) will twinkle, and the engine can't be started. Please add the oil in this condition.

● Ouput indicator lamp (green)
● Overload alarm lamp(red)
☼ Low oil level alarm lamp(red)
● Over speed alarm lamp (red)

4. Over speed alarm

Generator will stop at once and alarm lamp will be on if engin is over speed for (0.5～3 seconds).

● Ouput indicator lamp (green)
● Overload alarm lamp(red)
● Low oil level alarm lamp(red)
☼ Over speed alarm lamp (red)

WARNING

■ To avoid spark, please connect the charge cable to generator first, then connect the battery. During dismantling, remove the battery first.

■ Do not confuse the + and - pole, or the generator and battery will be damaged.

DANGER

■ For car battery charge application, disconnect the battery earth cable before connecting to the generator. During dismantling, disconnect the charge cable before earthing, which will prevent the short circuit and spark.

■ Do not start the car if the genetor sill keep connecting with the car.